



Reskilling Teachers for Digital Pedagogy in Post-Pandemic Era: Challenges and Opportunities

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Abstract

The integration of digital pedagogy into the educational process at an extremely fast pace, especially since the COVID-19 pandemic and even after it, has brought about changes in teaching and learning practices. The current research focuses on the identification of difficulties in applying digital pedagogy in classes for teachers and the advantages that teachers gain from using it. The research methodology of this study is qualitative research, and its data gathering process involves an in-depth review of literature. Data was gathered from reputable secondary sources like Scopus-indexed journals, research articles peer-reviewed and published in other databases, Google Scholar, ScienceDirect, IEEE Xplore, and educational reports associated with the coronavirus pandemic. Reluctance to change and lack of institutional support also make implementation difficult. Nevertheless, research has revealed several benefits of digital learning approaches. These include improved teaching, increased student engagement, responsiveness, and the availability of multiple learning sources. According to the results, its effective implementation can create a more tolerant, adaptable, and forward-looking educational framework that will improve the quality of teaching and learning in the digital age.

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Introduction

Education is a key component of poverty alleviation programs and socio-economic development initiatives. The coronavirus outbreak has caused significant disruption to the education system, affecting students and educators, and all types of entrepreneurial education and training, universities and skills development centers around the world (Hamburg, 2021) ^[5]. The coronavirus outbreak has led to a significant shift towards the use of blended/online teaching and learning methods, which are incorporating emerging technologies into the teaching process (Ng *et al.*, 2020; Sartika *et al.*, 2021; Whalley *et al.*, 2021) ^[14, 20]. The coronavirus outbreak has led to the adoption of blended/online learning processes, where emerging technologies are integrated into teaching to enhance student performance (Ng *et al.*, 2023). Emerging digital technologies have emerged as an important tool that language instructors can use to improve their teaching process (Li, 2017). In addition, teacher education and training programs need to adapt to these new demands. Being digitally literate is no longer optional; it is mandatory in today's society to ensure quality and equitable educational opportunities in a technology-driven world (UNESCO, 2022). The aim of this paper is to explore the difficulties, needs, and approaches involved in reskilling teachers in digital learning environments.

Digital Pedagogy

The concept of digital learning refers to a teaching method that focuses on transforming teaching and learning across the classroom through digital technology. In addition to utilizing teachers' knowledge and skills in digital learning, digital learning also includes students' ability to communicate, collaborate, create, discover, and manage through technology (Huang *et al.*, 2024) ^[7]. The main motivation for implementing new technologies comes from educational needs, which can only be met through the integration of technological advances. Through digital learning, various tools are provided to facilitate personalized learning based on students' cognitive abilities (Huang *et al.*, 2024) ^[7]. Generally, digital learning strategies have changed the way we acquire, interact with, and process information, with a greater emphasis on participation in knowledge production and construction rather than on knowledge acquisition alone. Therefore, the application of digital learning strategies has shifted the teaching approach from focusing on teacher knowledge and skills to an alternative way of working in a digital environment. This means that the focus has shifted from teacher skills such as literacy and effectiveness in organizing teaching using digital tools to the application of digital tools to organize students' learning processes (Huang *et al.*, 2024) ^[7].

Reskilling Teacher

Reskilling teachers is not just about introducing them to digital technologies; it requires a fundamental shift in the way they teach their students. Effective digital teaching strategies incorporate digital tools in ways that make learning engaging, personalized, and thought-provoking for students (Howard *et al.*, 2021) ^[6]. Teachers should move away from traditional lecture-based methods and instead provide interactive and student-centered instruction through platforms such as LMSs, virtual classroom applications, and AI-assisted instructional software. However, professional development initiatives should not be limited to a few sessions; they should create a series of opportunities for hands-on training where teachers can explore and improve digital teaching methods (Darling-Hammond *et al.*, 2022) ^[3].

Review Of Related Literature

Elsayary (2023) ^[4] investigated the study “*The impact of a professional upskilling training programme on developing teachers' digital competence*”. The aim of the present study is to examine the impact of skill development training programs on the development of teachers' digital competence. A sequential mixed methods design was used to conduct this study. The quantitative data collection method was an online survey with closed-ended questions. Qualitative data was collected through focus group discussions among teachers through the Zoom meeting application. The results obtained from this study help us analyze the impact of skill development training programs on teachers' digital competence. It is necessary for educators to provide relevant training to teachers.

Huang *et al.* (2024) ^[7] investigated the study on “*Digital Pedagogy for Sustainable Education Transformation: Enhancing Learner-Centred Learning in the Digital Era*”. This study presents the Digital Teaching Methodology for Sustainable Educational Transformation (DP4SET) model,

which can be applied to new teaching and learning models driven by digital technology. This study uses a qualitative methodology. This introduction of the digital teaching method lays the foundation for incorporating cutting-edge digital technology into modern education.

Ju-Zaveroni & Lee (2023) ^[8] examined the entitled “*Online Language Learning in Participatory Culture: Digital Pedagogy Practices in the Post-Pandemic Era*”. Drawing on a case study of the development of teaching methods for a foreign language module at a UK university during the pandemic, this paper seeks to explore how the application of digital strategies can enrich the foreign language learning experience in online classrooms. This paper adopts a qualitative research methodology. This paper argues that foreign language teachers should act as facilitators who are able to create participatory learning environments for their students.

Ng *et al.* (2023) was conducted the entitled on “*Teachers' AI digital competencies and twenty-first century skills in the post-pandemic world*”. This paper examines how artificial intelligence technology can be used to improve teaching and learning. This paper uses a qualitative deep data analysis approach. It makes some recommendations for educators and researchers to encourage the use of artificial intelligence in education.

Trust and Whalen (2021) ^[17] conducted a study titled “*K-12 teachers' experiences and barriers to using technology for emergency remote learning during the COVID-19 pandemic*”. This paper examines the barriers K-12 teachers face in using technology for emergency distance learning. This is an exploratory qualitative study. The results of the study show that although the use of digital technologies has increased, they are still improving traditional communication, information distribution, and management within the classroom.

Objectives of The Study

1. To identify the challenges face by teachers in implementing digital pedagogy in the classroom.
2. To identify the benefits that teachers face in implementing digital pedagogy in the classroom.

Methodology of The Study

The current study was a type of data-based (in-depth review-based) research, which is considered as qualitative research. Content analysis was used as the method of analyzing the sources (web links/research articles). Relevant databases such as Google Scholar, JSTOR and ScienceDirect were searched using the following keywords: “Digital Learning Methods in Education”, “Role of Digital Learning Methods in Education”, “Benefits of Digital Learning Methods in Higher Education”, “Barriers for Teachers in Implementing Digital Learning Methods in Education”, “Reskilling Teachers for Digital Learning Methods”, “Digital Learning Methods in the Post-Pandemic Era”. Additional web sources and databases were also used to add recent information on this topic. The collected data was systematically organized into different themes to identify emerging trends and findings. These themes reveal an important issue in the implementation of digital teaching methods by teachers in the

education sector and the role of digital teaching methods in the reskilling of teachers after the pandemic.

Discussion & Finding

Objectives 1: The challenges of teachers face in implementing digital teaching in the classroom

The rapid pace of technological innovation and the increasing demand for creative approaches in teaching have made the incorporation of digital learning methods an important component of contemporary education. Digital learning methods refer to the effective application of digital media and technology to facilitate the learning process (Zou *et al.*, 2025)^[21]. Digital learning methods allow for personalization of learning, increased accessibility, and active participation of students. However, despite the great benefits of digital learning methods, their implementation poses various difficulties for educators due to skills, infrastructure, and organizational issues (Montero-Mesa *et al.*, 2023)^[12]. Teachers are crucial in the introduction of digital learning methods, as they are the ones who are supposed to design, implement, and evaluate digital learning. However, the transition from traditional teaching techniques to digital learning requires a great deal of coordination on the part of teachers. Therefore, teachers have to overcome many obstacles that hinder the integration of digital media into the learning process.

- **Lack of Adequate Infrastructure and Technical Resources:** The main barrier to the adoption of digital learning methods is limited infrastructural resources and technology. Achieving effective digital learning methods requires reliable connectivity, digital devices, and software (Zou *et al.*, 2025)^[21]. Despite this, many educational institutions face significant problems in their infrastructure. These problems include unreliable internet connectivity, outdated technology, and lack of technical support, which hinder the entire learning process (Su & Yin, 2025).
- **Insufficient Digital Competence among Teachers:** Another significant barrier is the lack of digital literacy among teachers. Digital learning requires a combination of technical, pedagogical, and subject-specific skills, known as TPACK (Kaminskienė *et al.*, 2022)^[9]. Most teachers lack the skills needed to use technology in their teaching. The inability to apply technology in education leads to a lack of confidence and a reluctance to incorporate technology, which in turn hinders the effectiveness of digital learning (Montero-Mesa *et al.*, 2023)^[12].
- **Limited Professional Development Opportunities:** Professional development plays an important role in developing teachers' digital skills and competencies. Unfortunately, very few teachers have the opportunity to develop their digital competencies through training courses on digital teaching methods (Montero-Mesa *et al.*, 2023)^[12]. In cases where such opportunities are created for teachers, the training is often inadequate, outdated, or inappropriate for the needs of specific teachers (Zou *et al.*, 2025)^[21].
- **Resistance to Change and Traditional Teaching Practices:** Resistance to change can be a significant barrier to incorporating digital learning methods. Traditional teaching methods may be preferred due to familiarity with the methods, making teachers wary of implementing technological innovations. This resistance may stem from fear of failure, insecurity, and doubts about the benefits of technology. Furthermore, the entrenched nature of rote and test-based learning can create barriers to any new approach to teaching and learning (Su & Yin, 2025).
- **Increased Workload and Time Constraints:** The use of digital teaching methods generally creates additional workload for teachers. This is because teachers have to create digital lesson plans, prepare multimedia materials, and assist in online teaching (Alam *et al.*, 2025)^[1]. Such responsibilities can become burdensome. Most teachers find it difficult to integrate digital teaching methods with their regular work (Montero-Mesa *et al.*, 2023)^[12].
- **Lack of Student Engagement and Classroom Management:** Another challenge for educators is maintaining student engagement in digital learning environments. While technology allows for increased interaction among students, it can also be a distraction if not used appropriately. Furthermore, it is difficult for teachers to monitor student engagement in virtual or hybrid classrooms (Zou *et al.*, 2025)^[21].
- **Lack of Institutional Support and Leadership:** Institutional support is essential for implementing digital learning methods. Unfortunately, many educators report that schools lack support from education authorities and administrators (Su and Yin, 2025). There is a lack of funding, technical assistance, and policy guidance. Without proper support from education authorities, teachers may find themselves alone in their efforts to incorporate digital technologies into their teaching methods (Montero-Mesa *et al.*, 2023)^[12].
- **Digital Divide and Inequality among Students:** Digital inequality is one of the problems in the use of digital learning methods. Students may not have access to the technology they need to learn, which results in different learning opportunities (Zou *et al.*, 2025)^[21]. Teachers need to adapt their teaching methods to suit those students, and this can be a difficult task. Inequality makes the implementation of digital learning methods less effective (Su & Yin, 2025).
- **Lack of Assessment and Evaluation:** Assessing student performance in a digital learning environment has its own set of challenges. Using traditional assessment methods to assess digital learning outcomes may prove ineffective. Teachers should develop innovative ways to assess digital learning outcomes; however, many teachers lack the necessary skills or tools to achieve the desired outcomes (Montero-Mesa *et al.*, 2023)^[12].

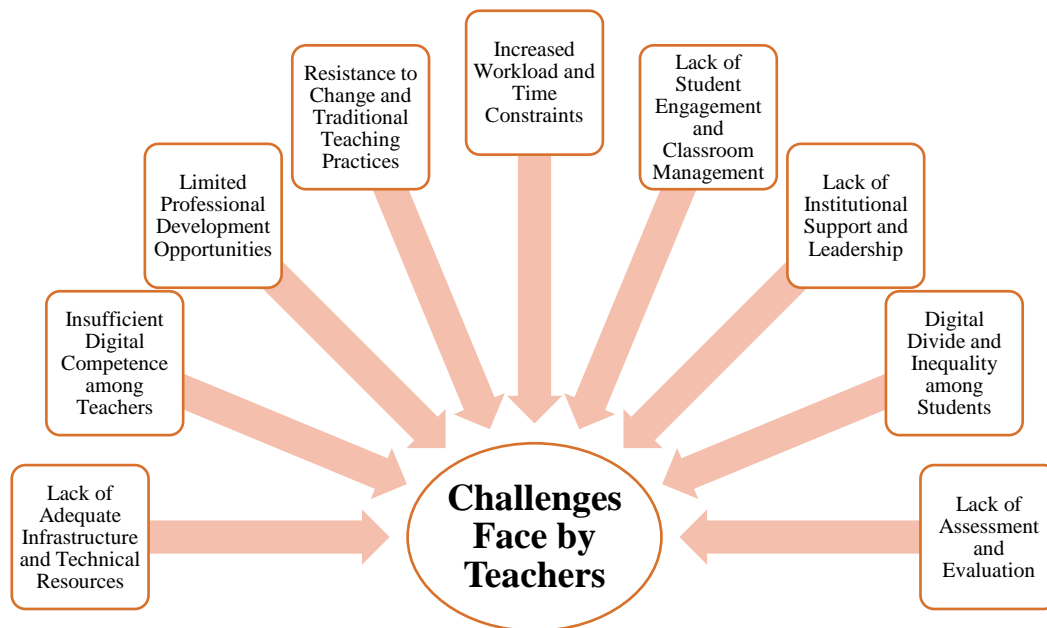


Fig 1: The challenges face by teachers in implementing digital teaching in the classroom)

The use of digital learning methods is an important aspect of modern education, which uses technology to enhance the learning process. Some of its benefits include personalized learning and increased engagement, but there are also some barriers. The main barriers for teachers include inadequate infrastructure, lack of technological skills, insufficient professional training, reluctance to change, excessive workload, difficulty in engaging students, lack of institutional support, and digital inequality. These barriers make it difficult for teachers to effectively adopt digital learning methods.

Objectives 2: To identify the benefits of teacher experience in implementing digital pedagogy in the classroom

The concept of digital learning has emerged as a revolutionary concept in modern education, allowing teachers to incorporate technology into their teaching and learning processes. Digital learning refers to the application of digital technologies, systems, and resources to enhance the teaching process, student engagement, and learning process (Zou *et al.*, 2025) ^[21]. The advent of digital learning is leading teachers to move away from traditional teaching methods and towards more engaging teaching methods, which have several advantages.

- **Enhanced Teaching Effectiveness:** The first benefit of using digital teaching methods is its impact on teaching efficiency. With the help of digital devices, teachers can explain the content of the lesson through various means, including videos, simulations, and interactive lessons, which improves students' ability to understand difficult concepts (Zou *et al.*, 2025) ^[21]. This method helps teachers to consider different learning styles and be more efficient and inclusive. Furthermore, the use of digital technology allows for immediate feedback, which can be used to improve teachers' teaching (Kaminskienė *et al.*, 2022) ^[9].

- **Improved Student Engagement and Participation:** Digital teaching methods have been shown to increase student engagement and participation in the classroom. For example, digital tools such as quizzes and polls have been shown to be quite effective in encouraging students to actively participate in the learning process (Bond *et al.*, 2023) ^[2]. The use of multimedia materials enables teachers to maintain students' attention throughout a class period. In addition, digital teaching methods encourage collaboration among students (Zou *et al.*, 2025) ^[21].
- **Personalized and Adaptive Learning:** In digital learning systems, educators can personalize learning to meet the specific needs of students. Educators can use learning management systems and personalized technology to monitor student progress and tailor support to them (Montero-Mesa *et al.*, 2023) ^[12]. This approach can help meet diverse educational needs and provide appropriate support to all students. Personalized learning is beneficial for student motivation and success, as it allows students to learn at their own pace (Kaminskienė *et al.*, 2022) ^[9].
- **Access to Diverse Learning Resources:** The application of digital teaching methods helps teachers access a wide range of educational resources. Databases, electronic books, videos, and educational materials on the Internet help teachers improve their teaching content and provide students with different ways to learn (Zou *et al.*, 2025) ^[21]. Access to international knowledge contributes to improving the teaching process and helps teachers keep themselves updated with the latest news in their respective fields (Montero-Mesa *et al.*, 2023) ^[12].
- **Facilitation of Collaborative Learning:** Digital learning systems encourage collaboration in the learning process, allowing both teachers and students to communicate with each other through digital means.

There are various ways to communicate and collaborate, including discussion boards, video calls, and document sharing (Bond *et al.*, 2023) ^[2]. Digital learning systems make it possible for teachers to create an environment that encourages working together to solve a problem (Montero-Mesa *et al.*, 2023) ^[12].

- **Flexibility in Teaching and Learning:** Another advantage of digital teaching is its flexibility, which positively affects the teaching process of students. Instructors can teach simultaneously and at different times according to the students' preferences, which ensures learning at their own pace (Zou *et al.*, 2025) ^[21]. This is especially helpful when working with diverse groups of students, who have different schedules and learning styles. Instructors can reuse digital content for lesson preparation, which saves preparation time (Kaminskienė *et al.*, 2022) ^[9].
- **Efficient Assessment and Feedback:** The concept of digital teaching methods makes the testing process more effective for teachers. The use of online tests enables teachers to test their students effectively and efficiently (Montero-Mesa *et al.*, 2023) ^[12]. With automated assessment systems, teachers can save time and energy, which can be used to improve the quality of teaching

methods. In addition, digital feedback systems help students to give immediate feedback on their performance (Zou *et al.*, 2025) ^[21].

- **Promotion of Innovative Teaching Practices:** The use of technology encourages teachers to adopt innovative teaching methods. Technologies such as virtual reality, augmented reality, and gamification create an immersive learning environment for students (Zou *et al.*, 2025). Through this, they can test different teaching methods and see which ones are most effective in improving student learning, such as flipping the classroom or adopting blended learning methods (Bond *et al.*, 2023) ^[2].
- **Enhanced Communication and Connectivity:** The implementation of digital teaching methods facilitates improved communication between teachers, students, and parents. Digital tools help teachers communicate effectively, share information, provide updates, and answer students' questions (Zou *et al.*, 2025) ^[21]. This improved communication creates a supportive environment for learning and connects all parties involved. In addition, digital tools facilitate collaboration between teachers and the learning community (Bond *et al.*, 2023) ^[2].

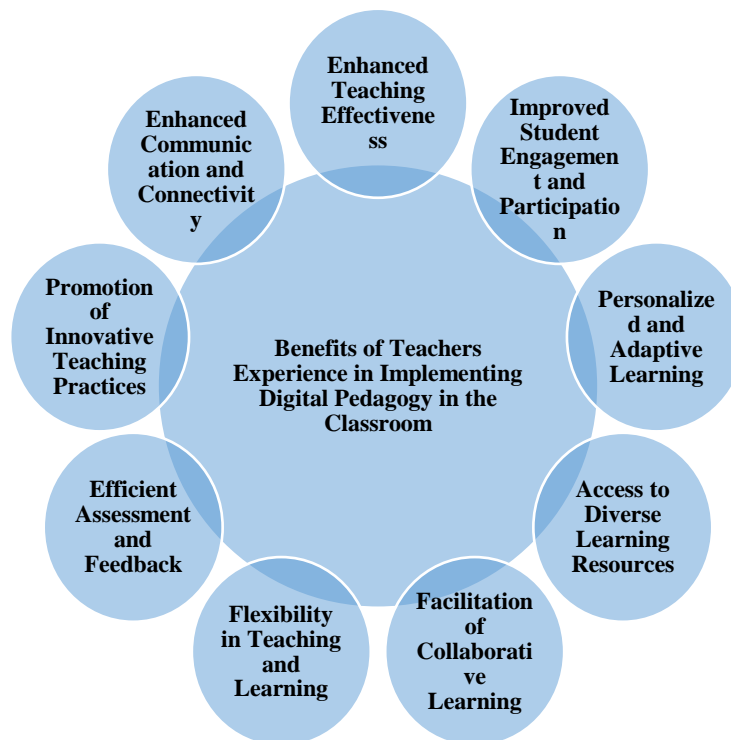


Fig 2: Benefits of Teachers Experience in Implementing Digital Pedagogy in the Classroom

Digital education is an innovative approach to education, where technology is used to facilitate the teaching and learning process and increase its efficiency and effectiveness. Digital education uses technology to provide a variety of teaching methods, which can be adapted to different learning styles and provide immediate feedback. Digital education makes it possible to engage more students

using various interactive techniques and supports personalized learning through adaptive technology. Moreover, it opens up vast possibilities for students, encourages collaboration and ensures flexible teaching methods. Effective assessment techniques through technology also support the learning process and innovation helps teachers improve their skills.

Conclusion

In summary, this study reveals that digital learning approaches serve as a transformative approach for reskilling teachers in the post-pandemic era, where digital learning approaches will help teachers enhance their technological, pedagogical, and professional skills. This is important because it helps teachers adopt new types of teaching methods such as virtual, online, or hybrid learning, and as a result, the teaching process becomes more flexible. Furthermore, digital learning approaches encourage innovative teaching methods that are beneficial for both teachers and students. Finally, digital learning approaches facilitate lifelong learning among teachers with the help of digital media. In addition, it enhances teachers' skills in applying data-based approaches to assessment and personalized learning, thereby improving educational outcomes. However, continuous capacity-building efforts should be made for the effective adoption of digital learning methods. Generally speaking, digital learning methods not only help teachers develop essential skills for the 21st century, but also prepare them to successfully address future educational challenges.

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